I claim:

1. A method of controlling packet transmission in a power line communication (PLC)-based local area network (LAN) comprising:

providing a PLC centrol coordinator in the PLC LAN for managing allocation of PLC LAN resources; and

providing, for any packet traversing the PLC LAN, a destination station MAC address, a source station MAC address, and a temporary equipment identifier (TEI) for the transmitting PLC station.

2. The method of claim 1 which includes using the ConnectionID in place of a MAC addresses for any packet while the packet is traversing the PLC LAN.

3. The method of claim 1 which includes providing a PLC MAC bridging device for storing information about the source station and the destination station for a connection at the PLC bridge device.

4. The method of claim 3 wherein the PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridge devices on the same PLC LAN.

5. The method of claim 3 wherein a PLC MAC bridge establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, bridge TEI and destination station 48-bit MAC address are cached in the bridge.

6. The method of claim 3 wherein a PLC MAC bridge establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridge TEI and destination station 48-bit MAC address are cached in the bridge.

7. The method of claim 1 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridge.

8 The method of claim 1 which includes bridging packets across the PLC LAN only in PLC bridging devices.

9. The method of claim 1 which includes removing 48-bit MAC addresses of the MAC header for bridged packets.

10. The method of claim 9 which includes interworking the bridged packets between the PLC LAN and any non-PLC LAN using the ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC LAN.

11. The method of claim 10 wherein said interworking of packets from a non-PLC LAN by a bridge device includes the re-addressing of the packet by replacing the source 48-bit MAC address and the designation 48-bit MAC address with a ConnectionID, which is contained in the ConnectionID field in the MAC Header.

12. The method of claim 10 wherein, for packets which are transmitted from the PLC-LAN onto a non-PLC LAN across a bridge device, interworking the packets, including removing the PLC MAC header and forming the LAN MAC header containing the source station 48-bit MAC address and the destination 48-bit MAC address.

13. The method of claim 1 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

13. A method of controlling packet transmission in a power line communication (PLC)-based local area network (LAN) comprising:

providing a PLC centrol coordinator in the PLC LAN for managing allocation of PLC LAN resources;

providing, for any packet traversing the PLC LAN, a destination station MAC address, a source station MAC address, and a temporary equipment identifier (TEI) for the transmitting PLC station; and

removing 48-bit MAC addresses of the MAC header for bridged packets, and interworking the bridged packets between the PLC LAN and any non-PLC LAN using the ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC LAN

14. The method of claim 13 wherein a PLC MAC bridge establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, bridge TEI and destination station 48-bit MAC address are cached in the bridge; and wherein a PLC MAC bridge establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridge TEI and destination station 48-bit MAC address are cached in the bridge.

15. The method of claim 13 which includes providing a PLC MAC bridging device for storing information about the source station and the destination station for a connection at the PLC bridge device, wherein the PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridge devices on the same PLC LAN.

16. The method of claim 13 wherein said interworking of packets from a non-PLC LAN by a bridge device includes the re-addressing of the packet by replacing the source 48-bit MAC address and the designation 48-bit MAC address with a ConnectionID, which is contained in the ConnectionID field in the MAC Header; and wherein, for packets which are transmitted from the PLC-LAN onto a non-PLC LAN across a bridge device, interworking the packets, including removing the PLC MAC header and forming the LAN MAC header containing the source station 48-bit MAC address and the destination 48-bit MAC address.

17. The method of claim 13 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridge.

18 The method of claim 13 which includes bridging packets across the PLC LAN only in PLC bridging devices.

19. The method of claim 13 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

20. The method of claim 13 which includes using the ConnectionID in place of a MAC addresses for any packet while the packet is traversing the PLC LAN.